

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

- 1) (currently amended) A method for making a crystalline silicoaluminophosphate (SAPO) membrane, the method comprising the steps of:
 - a) providing a porous support;
 - b) preparing an aqueous SAPO forming gel comprising an organic templating agent;
 - c) aging the gel;
 - d) contacting the porous support with the aged gel;
 - e) heating the porous support and the gel to form a layer of SAPO crystals on the surface of the support; and
 - f) calcining the SAPO layer to remove the templating agentwherein the gel is aged at least 24 hours between about 290 K and about 300K.
- 2) (original) The method of claim 1, wherein the SAPO is selected from the group consisting of SAPO-5, SAPO-11, SAPO-16, SAPO-17, SAPO-20, SAPO-31, SAPO-34, SAPO-35, SAPO-37, SAPO-40, SAPO-41, SAPO-42, and SAPO-44.
- 3) (original) The method of claim 2, wherein the SAPO is SAPO-5, SAPO-11, or SAPO-34.
- 4) (original) The method of claim 3, wherein the SAPO is SAPO-34.
- 5) (original) The method of claim 1, wherein the porous support has a pore size large enough so that SAPO crystals can also form inside the pores of the support.

- 6) (previously presented) The method of claim 1, wherein the porous support has a pore size between about 0.2 microns and about 4 microns.
- 7) (original) The method of claim 1, wherein said support and said gel are heated to a temperature between about 420 K and about 500 K and the gel comprises: $1.0 \text{ Al}_2\text{O}_3$; $a \text{ P}_2\text{O}_5$; $b \text{ SiO}_2$; $c \text{ R}$; $d \text{ H}_2\text{O}$ where R is a quaternary organic ammonium templating agent and
a is between about 0.01 and about 52,
b is between about 0.03 and about 196,
c is between about 0.2 and about 5, and
d is between about 20 and about 300.
- 8) (original) The method of claim 7, where the SAPO is SAPO-34, R is tetra-ethyl ammonium hydroxide and
a is about 1
b is about 0.6
c is about 1.07 and
d is about 56.
- 9) (currently amended) The method of claim 1, wherein the gel is aged at least for more than 24 hours between about 290 K and about 300 K.
- 10) (currently amended) The method of claim 4, wherein the gel is aged at least for more than 24 hours between about 290 K and about 300 K.
- 11) (original) The method of claim 10, wherein the gel is aged at least 48 hours between about 290 K and about 300 K.
- 12) (original) The method of claim 1, wherein the porous support and gel are heated to a temperature between about 420 K and about 500 K.

- 13) (original) The method of claim 12, wherein the porous support and gel are heated to a temperature between about 465 K and about 480 K.
- 14) (original) The method of claim 1, further comprising repeating steps d) and e) at least once.
- 15) (original) The method of claim 14, wherein steps b) and c) are repeated at least once.
- 16) (original) The method of claim 14, wherein steps d) and e) are repeated until the SAPO layer is substantially impermeable to N_2 before performing step f).
- 17) (original) The method of claim 16, wherein steps d) and e) are repeated at least twice.
- 18) (original) The method of claim 1, further comprising washing and drying the support and the SAPO layer after step e).
- 19) (currently amended) A supported SAPO-34 membrane ~~made by the method of claim 1~~ having a CO_2/CH_4 separation selectivity greater than about 60 at a temperature of about 297 K for an approximately equimolar CO_2/CH_4 mixture with about 222 kPa feed pressure and about 138 kPa pressure drop and made by the method comprising the steps of:
- a) providing a porous support;
 - b) preparing an aqueous SAPO-34 forming gel comprising an organic templating agent;
 - c) aging the gel;
 - d) contacting the porous support with the aged gel;

e) heating the porous support and the gel to form a layer of SAPO-34 crystals on the surface of the support; and

f) calcining the SAPO-34 layer to remove the templating agent.

- 20) (currently amended) A supported membrane comprising a porous support and SAPO -34 crystals which are present within at least some of the pores of the support and which form a layer on at least one side of the support, and having a CO₂/CH₄ separation selectivity is greater than about 60 at a temperature of about 297 K for an approximately 50/50 equimolar CO₂/CH₄ mixture with about 222 kPa feed pressure and about 138 kPa pressure drop.
- 21)-23) (cancelled)
- 24) (original) The membrane of claim 20, wherein the thickness of the SAPO layer is less than about 20 microns.
- 25) (previously presented) The membrane of claim 20, wherein the porous support has an average pore size between about 0.2 micron and about 4 microns.
- 26) (original) The membrane of claim 20, wherein the porous support is in the form of a tube and the SAPO crystals are present within the tube pores and form layers on both the inside and the outside of the tube.
- 27) (original) The membrane of claim 26, wherein the thickness of the SAPO layer is less than about 20 microns.
- 28) (currently amended) The membrane of claim 26, wherein and the CO₂/CH₄ separation selectivity is greater than about 200 for an approximately 50/50 equimolar CO₂/CH₄ mixture at about 250 K with a pressure differential across the membrane of about 3 MPa.

- 29) (currently amended) The membrane of claim 26, wherein for CO₂/CH₄ separation the CO₂ permeate concentration is greater than about 99% for an approximately 50/50 equimolar CO₂/CH₄ mixture at about 250 K with a pressure differential across the membrane of about 3 MPa.
- 30) (withdrawn) A method for separating a first gas component from a gas mixture containing at least a first and a second gas component, the method comprising the steps of:
- a) providing a membrane of claim 20, the membrane having a feed and a permeate side and being selectively permeable to the first gas component over the second gas component;
 - b) applying a feed stream including the first and the second gas components to the feed side of the membrane;
 - c) providing a driving force sufficient for permeation of the first gas component through the membrane, thereby producing a permeate stream enriched in the first gas component from the permeate side of the membrane.
- 31) (withdrawn) The method of claim 30, wherein the membrane is a SAPO-34 membrane, first gas component is carbon dioxide and the second gas component is methane.
- 32) (previously presented) The method of claim 1, wherein the calcining temperature is between about 623 K and about 673 K.
- 33) (previously presented) The method of claim 1 wherein the support is a porous metal support.
- 34) (previously presented) The method of claim 5 wherein the gel does not completely fill the pores of the support.

- 35) (currently amended) A method for making a crystalline silicoaluminophosphate (SAPO) membrane, the method consisting essentially of the steps:
- a) providing a porous support;
 - b) preparing an aqueous SAPO forming gel comprising an organic templating agent;
 - c) aging the gel for more than 24 hours between about 290 K and about 300 K;
 - d) contacting the porous support with the aged gel;
 - e) heating the porous support and the gel to form a layer of SAPO crystals on the surface of the support;
 - f) washing and drying the support and the SAPO layer; and
 - g) calcining the SAPO layer to remove the templating agent,
- wherein steps d) and e) are repeated until the SAPO layer is substantially impermeable to N_2 before performing step f) and when step d) is repeated the gel is contacted with the porous support and the previously formed layer of SAPO crystals.
- 36) (previously presented) A method for making a crystalline silicoaluminophosphate-34 (SAPO-34) membrane, the method comprising the steps of:
- a) providing a porous support having a pore size between about 0.2 and about 4.0 microns;
 - b) preparing an aqueous SAPO-34 forming gel comprising an organic templating agent;
 - c) aging the gel for at least 24 hours between about 290 K and about 300 K;
 - d) contacting the porous support with the aged gel;
 - e) heating the porous support and the gel to form a layer of SAPO-34 crystals on the surface of the support wherein the porous support

and gel are heated to a temperature between about 465K and about 480 K;

- f) washing and drying the support and the SAPO-34 layer; and
- g) calcining the SAPO-34 layer to remove the templating agent, wherein the calcining temperature is between about 623 K and about 673 K;

wherein steps d) and e) are repeated until the SAPO-34 layer is substantially impermeable to N_2 before performing step f) and when step d) is repeated the gel is contacted with the porous support and the previously formed layer of SAPO-34 crystals.

- 37) (previously presented) The membrane of claim 20 wherein the support is a porous metal support.
- 38) (previously presented) The membrane of claim 37 wherein the support is a stainless steel support.
- 39) (new) The method of claim 36 wherein the gel is aged for more than 24 hours at a temperature between about 290 K and about 300K.
- 40) (new) The method of claim 36 wherein the gel is aged for at least 48 hours at a temperature between about 290 K and about 300K.